Appendix F – UE Test Pit Logs

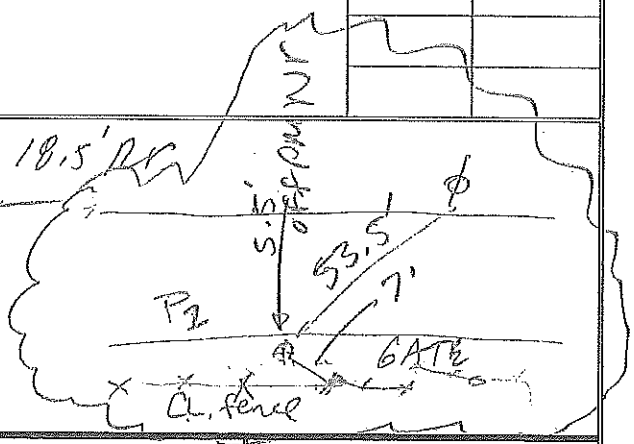
And Materials Testing

TEST PIT LOG

Project Name: Tolend Road Peer Review Dover, New Hampshire Contractor: Dover Dept. of Community Services/DPW Project No.: UE #1876	Date:: 10/6/14 Test Pit ID: TP#1 Engineer: P. MacDonald (Underwood Engineers, Inc.) Weather: SUNNY T=60±°F 8:30 AM Location: Sta. 128 + 35 13' Rt Ground Elevation: Pavement (see plan for locations)

Depth Below Grade	Strata Change or Water Level	Soil Description	Excav. Effort	Bldr Qty/ Size
0-3"		PAVMNT		
		GR. GRAVEL 1-3" STONES (STONEY)		
3-15"				
		GRAVEL 1-3" STONES		
15-26"		(MAT. SIMILAR TO ABOVE)		
26"				
39"	TP.	TP NON-WOVEN W/P		
		FINE-MED. SAND		
26-60"				
		NO WATER OBSERVED		

Remarks: PIZ. #1 INSTALLED 18.5' RT



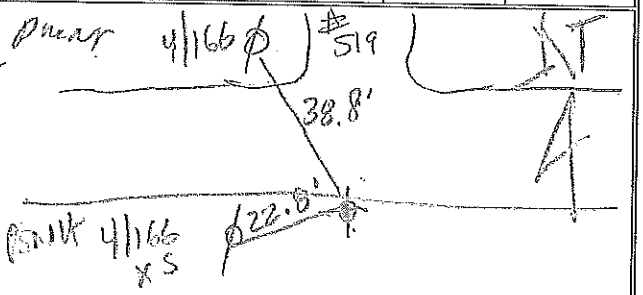
Test Pit Plan No.	Boulder	Class	Excavation Effort
	6" - 18"	A	E = Easy
	18" - 36"	B	M = Moderate
	36" - larger	C	D = Difficult

TEST PIT LOG

Project Name: Tolend Road Peer Review Dover, New Hampshire Contractor: Dover Dept. of Community Services/DPW Project No.: UE #1876	Date:: 10/6/14 Test Pit ID: TP#2 Engineer: P. MacDonald (Underwood Engineers, Inc.) Weather: SUNNY T= 60°F Location: Sta/59 + 80 15.5' RT Ground Elevation: Pavement (see plan for locations)

Depth Below Grade	Strata Change or Water Level	Soil Description	Excav. Effort	Blder Qty/ Size
0-3"		PMNT.		
3-12"		CR. GRAVEL 1-3" STONES		
12"		CR. GRAVEL 1-3" STONE		
23"		MATL (SIMILAR TO ABOVE)		
23"		DK. SANDY LOAM (W/HUMOUS)		
36"		ROOT @ 32" (ORGANICS)		
36"		FINE SAND (MOTTLED)		
60"				
		NO WATER OBSERVED		
		SHWT ~ BST. 30"-34"		

Remarks: P2 INSTALLED 6" OFF PMNT 16' RT



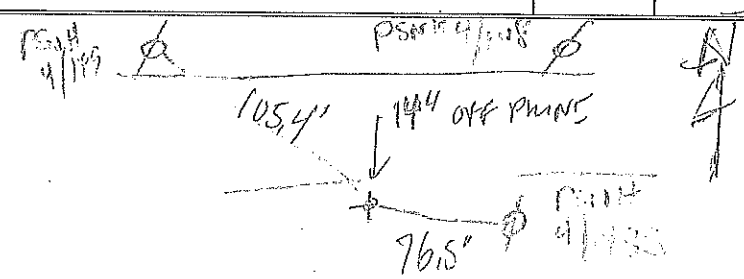
Test Pit Plan No.	Boulder	Class	Excavation Effort
	6" - 18"	A	E = Easy
	18" - 36"	B	M = Moderate
	36" - larger	C	D = Difficult

TEST PIT LOG

Project Name: Tolend Road Peer Review Dover, New Hampshire Contractor: Dover Dept. of Community Services/DPW Project No.: UE #1876	Date:: Test Pit ID: TP #3 Engineer: P. MacDonald (Underwood Engineers, Inc.) Weather: SUNNY 70-60°F, 11AM Location: Sta. 191 + 23 13' Rt Ground Elevation: Pavement (see plan for locations)

Depth Below Grade	Strata Change or Water Level	Soil Description	Excav. Effort	Bldr Qty/ Size
0-3"		PAVEMENT		
		CR. GRAV. 1-3" STONE		
3-19"				
		SANDY LOAM		
19-60"				
		NO WATER OBSERVED		
		PHOTOS TAKEN		

Remarks:
P3 INSTALLED
14' Rt



Test Pit Plan No.	Boulder	Class	Excavation Effort
	6" - 18"	A	E = Easy
	18" - 36"	B	M = Moderate
	36" - larger	C	D = Difficult

S.W.COLE ENGINEERING, INC.

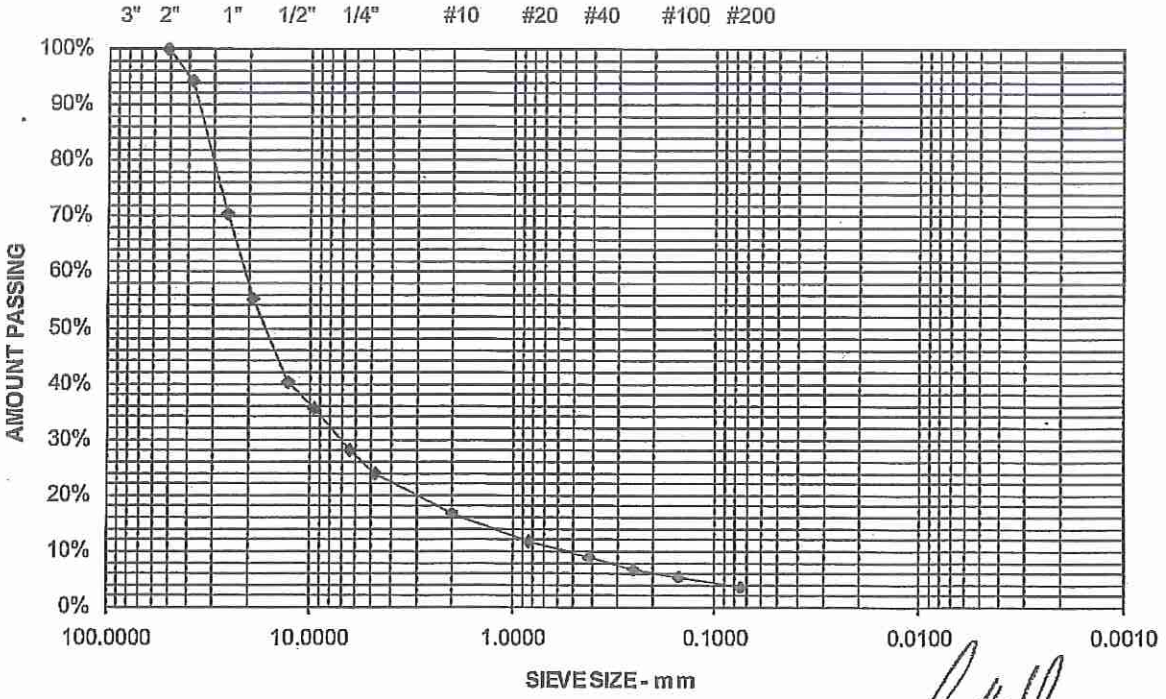
Report of Gradation

ASTM C-117 & C-136

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
		Lab ID	12779S
Client	UNDERWOOD ENGINEERS, INC.	Date Received	10/6/2014
Material Type	CRUSHED STONE AGGREGATE BASE	Date Completed	10/8/2014
Material Source	TP-1 (3"-15")	Tested By	RYAN LABONTE

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	NHDOT 304.4 CR. STONE SPECIFICATIONS (%)
50 mm	2"	100	100
38.1 mm	1-1/2"	94	85 - 100
25.0 mm	1"	71	
19.0 mm	3/4"	55	45 - 75
12.5 mm	1/2"	40	
9.5 mm	3/8"	35	
6.3 mm	1/4"	28	
4.75 mm	No. 4	24	10 - 45
2.00 mm	No. 10	17	
850 um	No. 20	12	
425 um	No. 40	9	
250 um	No. 60	7	
150 um	No. 100	5	
75 um	No. 200	3.7	0.0 - 5.0

SAMPLE MEETS SPECIFICATION



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Report of Gradation

ASTM C-117 & C-136

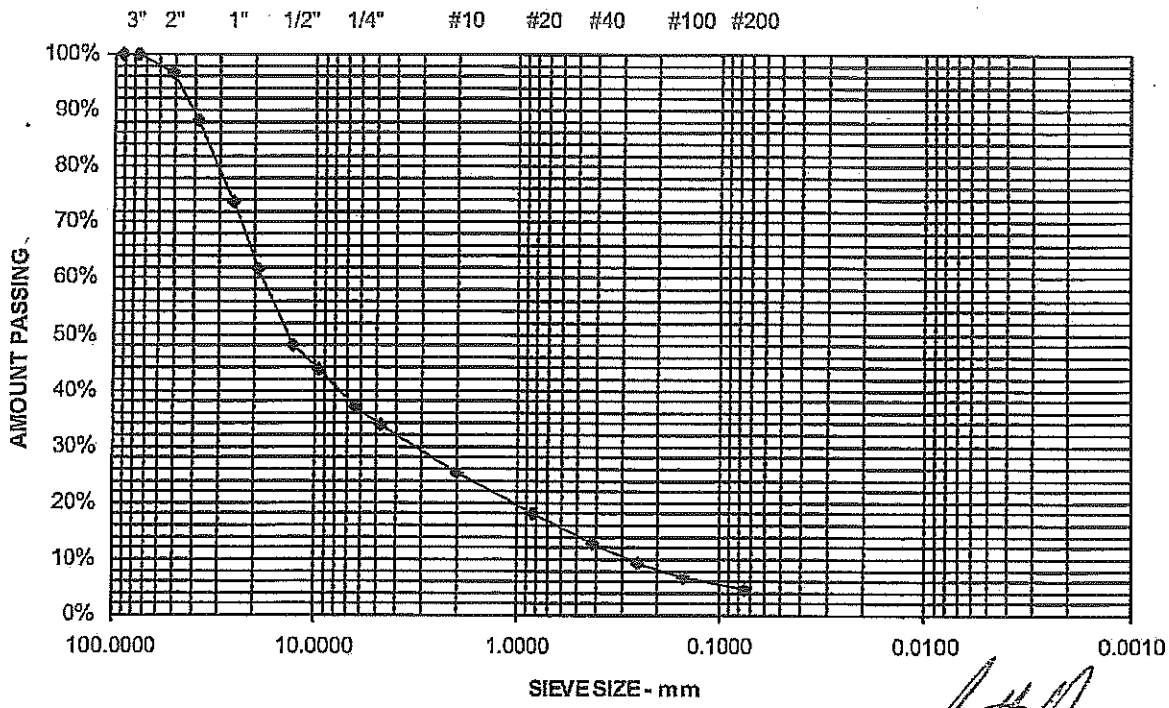
P

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12780S
Material Type	CRUSHED STONE AGGREGATE SUBBASE	Date Received	10/6/2014
Material Source	TP-1 (15"-26")	Date Completed	10/8/2014
		Tested By	MURRAY SWINDELL

NHDOT 304.5 CRUSHED STONE (COARSE)

STANDARD DESIGNATION (mm/um)	SIEVE SIZE	AMOUNT PASSING (%)	SPECIFICATIONS (%)
150 mm	6"	100	
90 mm	3-1/2"	100	100
75 mm	3"	100	85 - 100
50 mm	2"	97	
38.1 mm	1-1/2"	88	60 - 90
25.0 mm	1"	74	
19.0 mm	3/4"	61	40 - 70
12.5 mm	1/2"	48	
9.5 mm	3/8"	44	
6.3 mm	1/4"	37	
4.75 mm	No. 4	34	15 - 40
2.00 mm	No. 10	25	
850 um	No. 20	18	
425 um	No. 40	13	
250 um	No. 60	9	
150 um	No. 100	7	
75 um	No. 200	4.6	0.0 - 5.0

SAMPLE MEETS SPECIFICATION



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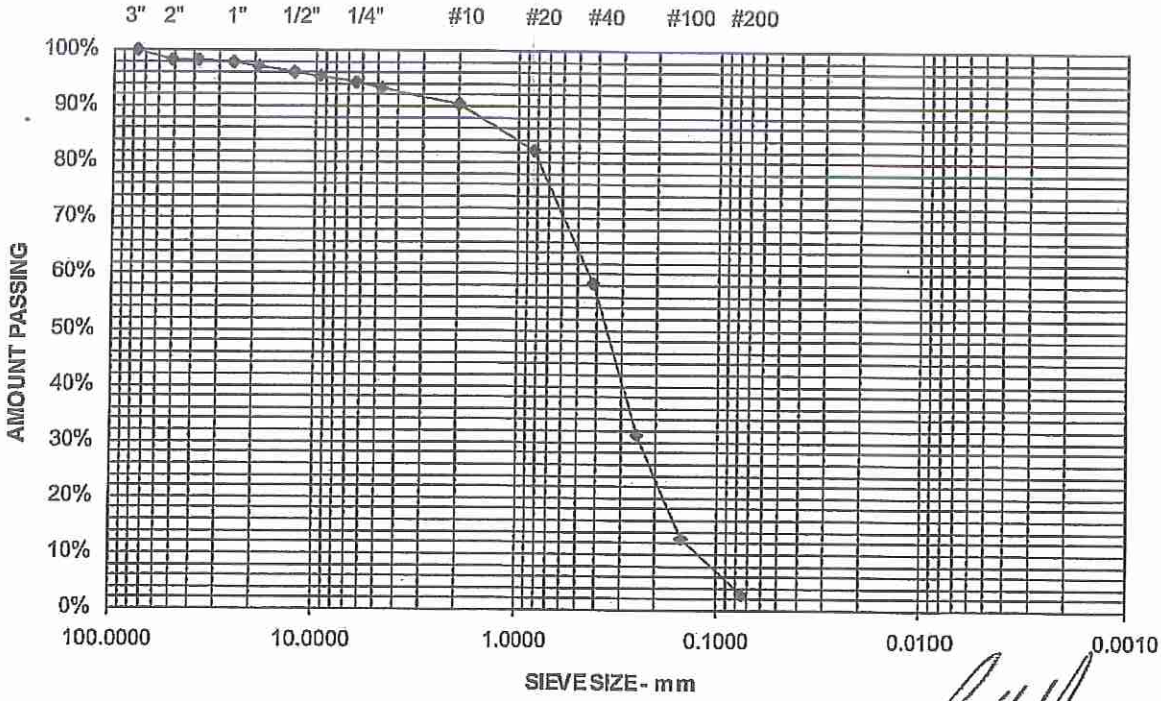
Report of Gradation

ASTM C-117 & C-136

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12781S
Material Type	MEDIUM TO FINE SAND	Date Received	10/6/2014
Material Source	TP-1 (30"-40") SUBGRADE	Date Completed	10/8/2014
		Tested By	RYAN LABONTE

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	SPECIFICATIONS (%)
75 mm	3"	100	
50 mm	2"	98	
38.1 mm	1-1/2"	98	
25.0 mm	1"	98	
19.0 mm	3/4"	97	
12.5 mm	1/2"	96	
9.5 mm	3/8"	95	
6.3 mm	1/4"	94	
4.75 mm	No. 4	93	
2.00 mm	No. 10	91	
850 um	No. 20	82	
425 um	No. 40	59	
250 um	No. 60	31	
150 um	No. 100	13	
75 um	No. 200	3.0	



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Report of Gradation

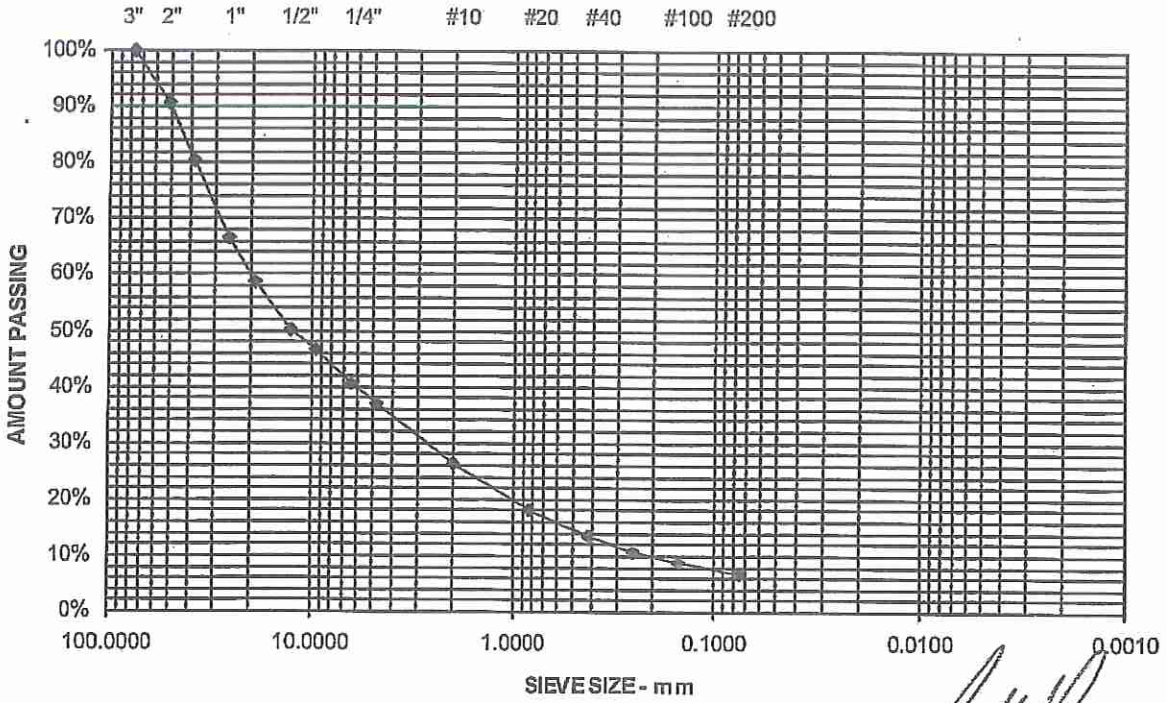
ASTM C-117 & C-136

F

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12782S
Material Type	CRUSHED STONE AGGREGATE BASE	Date Received	10/6/2014
Material Source	TP-2 (3"-12")	Date Completed	10/8/2014
		Tested By	MURRAY SWINDELL

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	NHDOT 304.4 CR. STONE SPECIFICATIONS (%)	
150 mm	6"	100		
100 mm	4"	100		
75 mm	3"	100		
50 mm	2"	91	100	
38.1 mm	1-1/2"	80	85 - 100	†
25.0 mm	1"	67		
19.0 mm	3/4"	59	45 - 75	
12.5 mm	1/2"	50		
9.5 mm	3/8"	47		
6.3 mm	1/4"	41		
4.75 mm	No. 4	37	10 - 45	
2.00 mm	No. 10	26		
850 um	No. 20	18		
425 um	No. 40	13		
250 um	No. 60	11		
150 um	No. 100	9		
75 um	No. 200	6.8	0.0 - 5.0	†

† SAMPLE DOES NOT MEET SPECIFICATION



Comments As received moisture content = 6.0%

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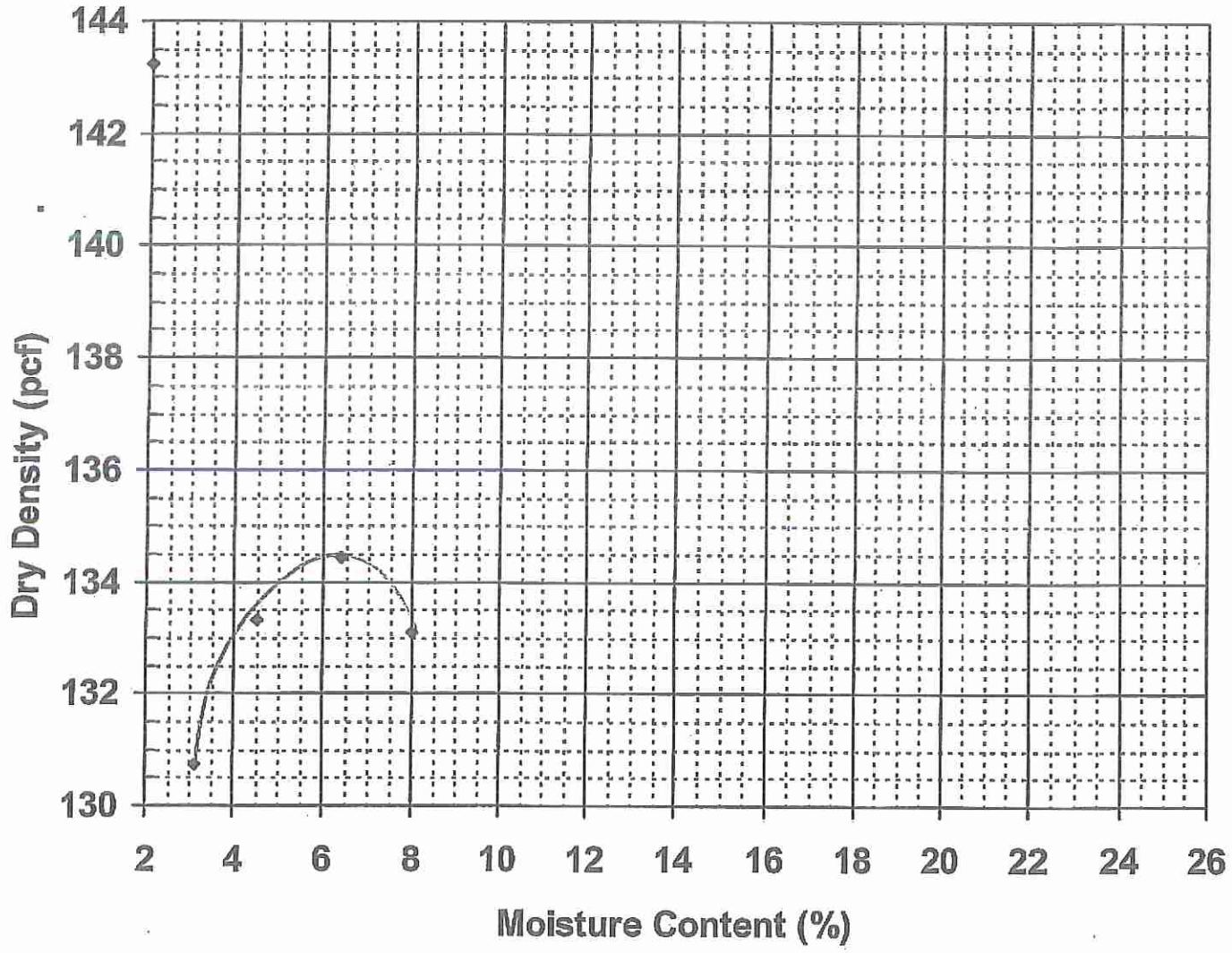
Report of Moisture-Density

Method ASTM D-1557 MODIFIED Procedure C

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12782S
Material Type	CRUSHED STONE AGGREGATE BASE	Date Received	10/6/2014
Material Source	TP-2 (3"-12")	Date Completed	10/8/2014
		Tested By	SAMUEL NIEBLING

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	133.3
Optimum Moisture Content (%)	4.5
Percent Oversized	30.0%

Corrected Dry Density (pcf)	139.7
Corrected Moisture Content (%)	3.8

Comments

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Report of Gradation

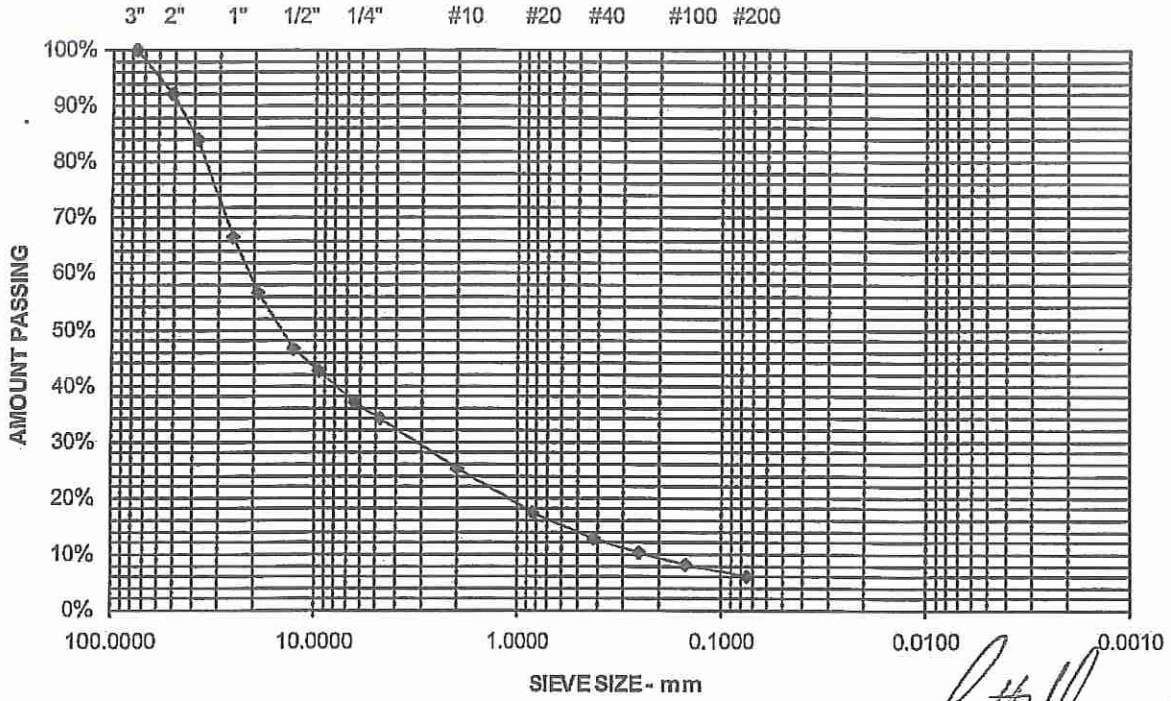
ASTM C-117 & C-136

F

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12783S
Material Type	CRUSHED STONE AGGREGATE SUBBASE	Date Received	10/6/2014
Material Source	TP-2 (12"-23")	Date Completed	10/8/2014
		Tested By	MURRAY SWINDELL

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	NHDOT 304.4 CR. STONE SPECIFICATIONS (%)		304.5
150 mm	6"	100			
100 mm	4"	100			100
75 mm	3"	100			85-100
50 mm	2"	92	100		
38.1 mm	1-1/2"	84	85 - 100	X	60-90
25.0 mm	1"	66			
19.0 mm	3/4"	57	45 - 75		40-70
12.5 mm	1/2"	46			
9.5 mm	3/8"	43			
6.3 mm	1/4"	37			
4.75 mm	No. 4	34	10 - 45		15-40
2.00 mm	No. 10	25			
850 um	No. 20	17			
425 um	No. 40	13			
250 um	No. 60	10			
150 um	No. 100	8			
75 um	No. 200	6.2	0.0 - 5.0	†	0-5

† SAMPLE DOES NOT MEET SPECIFICATION



Comments As received moisture content = 7.3%

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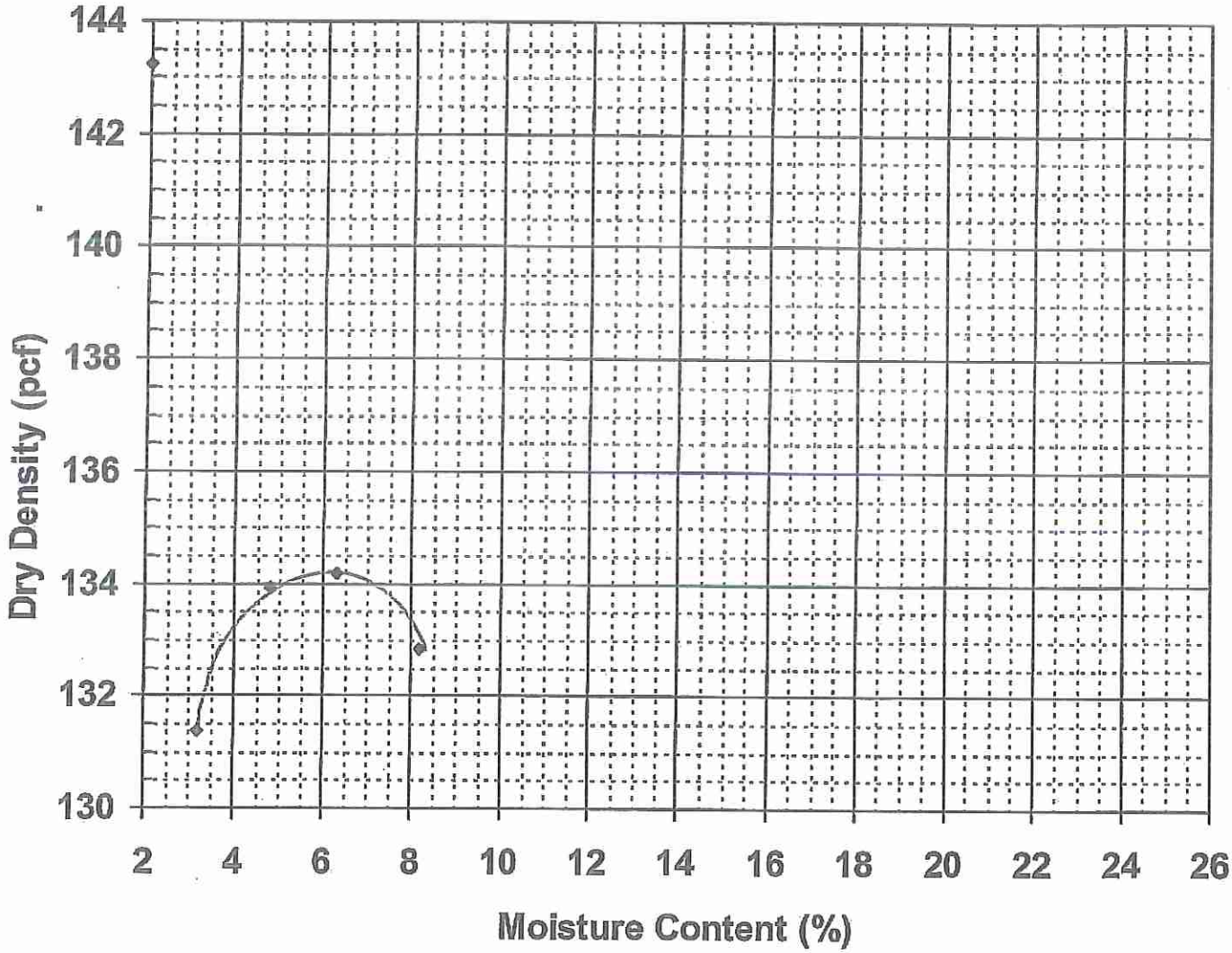
Report of Moisture-Density

Method ASTM D-1557 MODIFIED Procedure C

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12783S
Material Type	CRUSHED STONE AGGREGATE SUBBASE	Date Received	10/6/2014
Material Source	TP-2 (12"-23")	Date Completed	10/8/2014
		Tested By	SAMUEL NIEBLING

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	134.3
Optimum Moisture Content (%)	6
Percent Oversized	30.0%

Corrected Dry Density (pcf)	140.4
Corrected Moisture Content (%)	4.8

Comments

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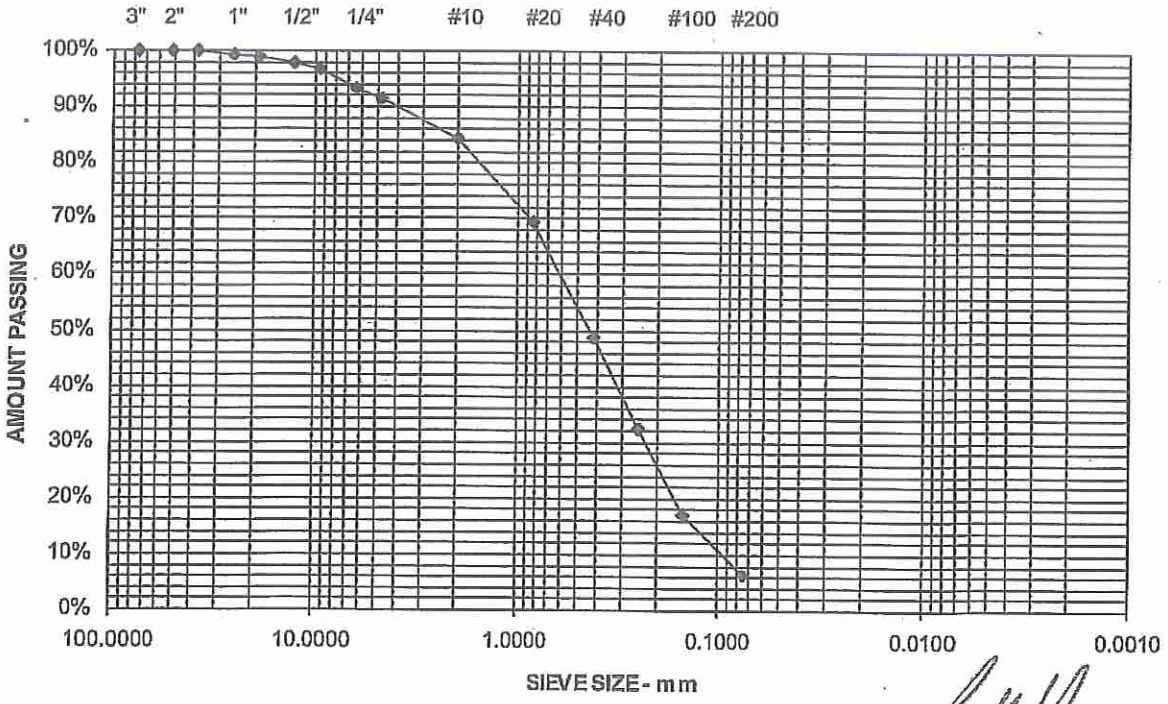
Report of Gradation

ASTM C-117 & C-136

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12784S
Material Type	FINE SAND	Date Received	10/6/2014
Material Source	TP-2 (23"-36") SUBGRADE	Date Completed	10/8/2014
		Tested By	RYAN LABONTE

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	SPECIFICATIONS (%)
150 mm	6"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	99	
19.0 mm	3/4"	99	
12.5 mm	1/2"	98	
9.5 mm	3/8"	97	
6.3 mm	1/4"	93	
4.75 mm	No. 4	91	
2.00 mm	No. 10	84	
850 um	No. 20	69	
425 um	No. 40	49	
250 um	No. 60	32	
150 um	No. 100	17	
75 um	No. 200	6.3	



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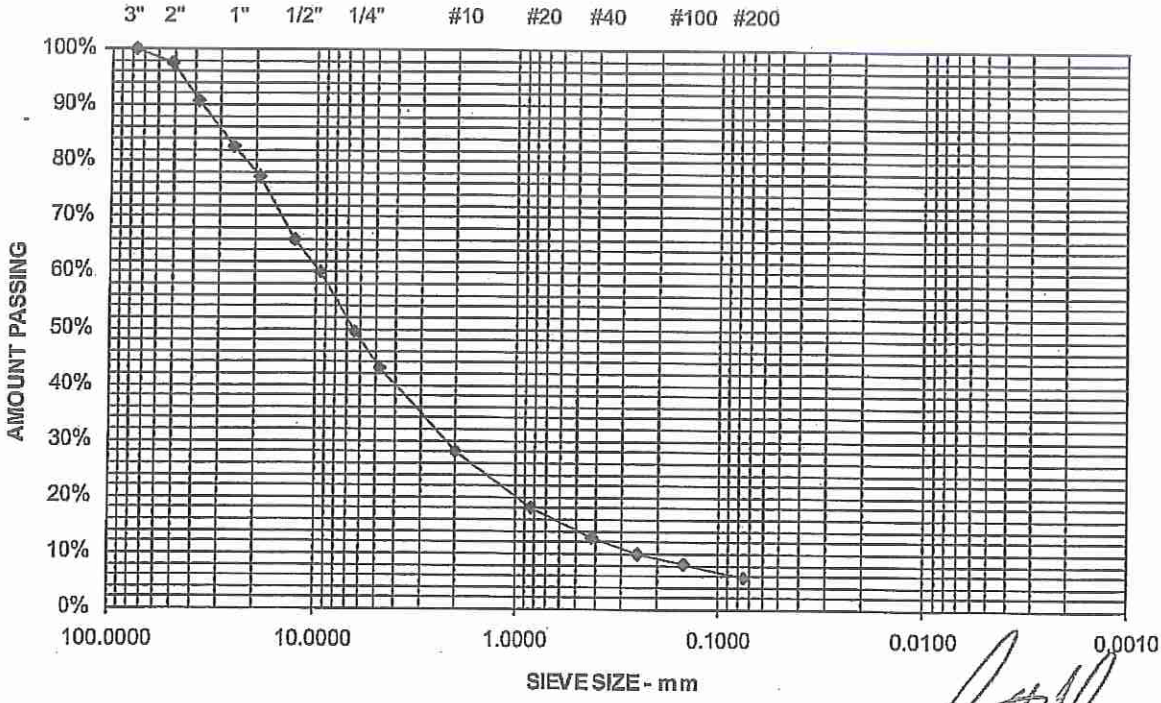
Report of Gradation

ASTM C-117 & C-136

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12785S
Material Type	CRUSHED STONE AGGREGATE BASE	Date Received	10/6/2014
Material Source	TP-3 (3"-19")	Date Completed	10/8/2014
		Tested By	RYAN LABONTE

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	NHDOT 304.4 CR. STONE SPECIFICATIONS (%)	
150 mm	6"	100		
100 mm	4"	100		
75 mm	3"	100		
50 mm	2"	97	100	
38.1 mm	1-1/2"	91	85 - 100	
25.0 mm	1"	83		
19.0 mm	3/4"	77	45 - 75	†
12.5 mm	1/2"	66		
9.5 mm	3/8"	60		
6.3 mm	1/4"	49		
4.75 mm	No. 4	43	10 - 45	
2.00 mm	No. 10	28		
850 um	No. 20	18		
425 um	No. 40	13		
250 um	No. 60	10		
150 um	No. 100	8		
75 um	No. 200	5.8	0.0 - 5.0	†

† SAMPLE DOES NOT MEET SPECIFICATION



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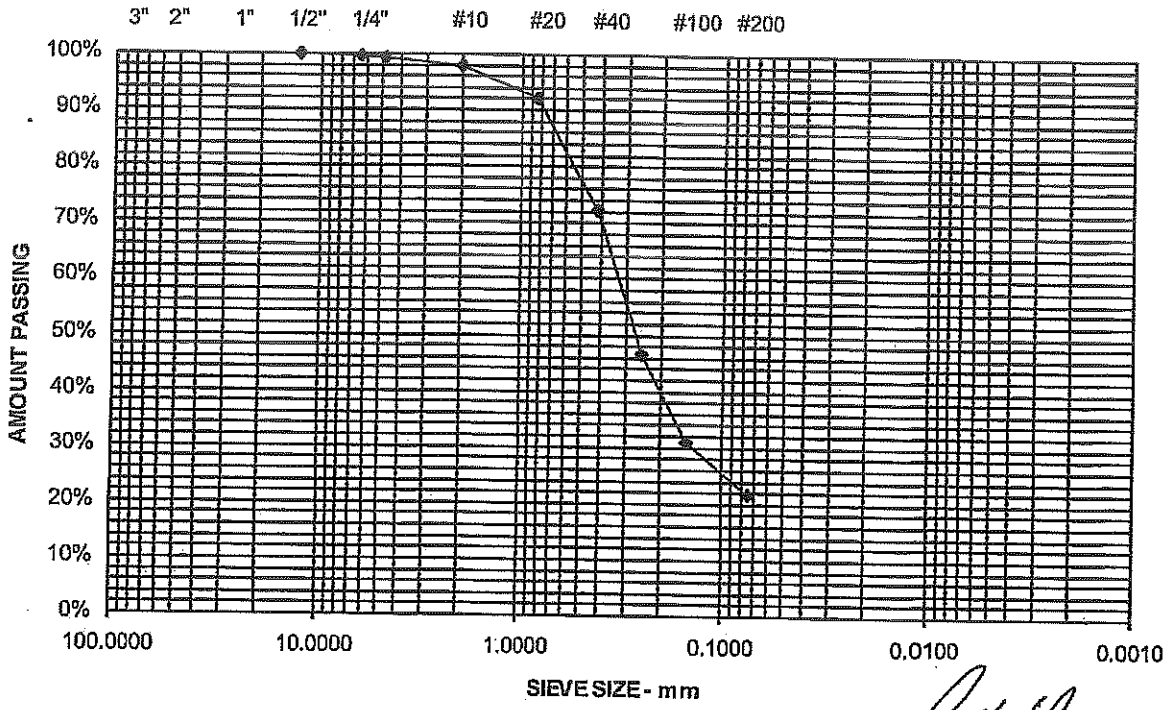
Report of Gradation

ASTM C-117 & C-136

Project Name	DOVER NH - TOLEND ROAD PAVEMENT EVALUATION	Project Number	14-1036
Client	UNDERWOOD ENGINEERS, INC.	Lab ID	12786S
Material Type	SILTY FINE SAND	Date Received	10/6/2014
Material Source	TP-3 (19"-60") SUBGRADE	Date Completed	10/8/2014
		Tested By	RYAN LABONTE

STANDARD DESIGNATION (mm/um)	SIEVE SIZE	AMOUNT PASSING (%)	SPECIFICATIONS (%)
12.5 mm	1/2"	100	
6.3 mm	1/4"	100	
4.75 mm	No. 4	99	
2.00 mm	No. 10	98	
850 um	No. 20	92	
425 um	No. 40	72	
250 um	No. 60	47	
150 um	No. 100	31	
75 um	No. 200	21.6	



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